

Borehole

41-02-02Log Event **A****Borehole Information**

Farm : <u>SX</u>	Tank : <u>SX-102</u>	Site Number : <u>299-W23-135</u>
N-Coord : <u>35,590</u>	W-Coord : <u>75,745</u>	TOC Elevation : <u>661.89</u>
Water Level, ft :	Date Drilled : <u>1/14/1972</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>140</u>	

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>03/1995</u>	Calibration Reference : <u>GJPO-HAN-1</u>	

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>4/19/1995</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>139.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>69.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>4/20/1995</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>70.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Log Event A

Analysis Information

Analyst : S.E. KosData Processing Reference : Data Analysis Manual Ver. 1Analysis Date : 8/4/1995**Analysis Notes :**

Borehole 41-02-02 was drilled in 1972 and deepened in 1973 to a depth of 140 ft. It is cased with a 6-in.-nominal-diameter steel casing; there is no record of grout in this hole. The wall thickness of the casing is 3/8 in. The casing correction used for data analysis was .33 in.; consequently, the reported activities may be slightly lower than actual. A water correction was not applied to the data below 134.4 ft.

Cs-137 was the only man-made gamma-ray emitting radionuclide identified from the gamma-ray peaks and was detected in three zones. From the surface down to 75 ft it occurred at varying concentrations and probably did not originate only from the surface. From 75 ft to about 120 ft it was detected intermittently at discontinuous locations at concentrations barely above MDA; the lower error bars fell below MDA value. Cs-137 was also detected at appreciable concentrations (up to 7 pCi/g) from 120 ft to TD.

Elevated total gamma activity was observed from 48 to 52 ft. Although Cs-137 was detected in this interval, the total gamma activity was significantly greater than the total gamma activity observed for comparable Cs-137 concentrations elsewhere in the borehole and clearly reflects the presence of Sr-90.

Log Plot Notes:

Three log plots are provided. The Cs-137 concentration is plotted alone to provide details of concentration and distribution. The error of calculated Cs-137 activity is shown by the error bars that represent the 95-percent confidence interval. The calculated MDA is represented as open circles on the log plots.

The natural gamma logs show the concentrations of the naturally occurring radionuclides, including potassium, uranium, and thorium (KUT). It is prepared to allow correlation of lithologic features between boreholes. The activities of the KUT data are typical for Hanford sediments. On the thorium plot, the MDA value is shown as zero at some depth locations. This zero value was a result of an anomaly in the commercial spectrum analysis software which has been corrected by the vendor. Because the MDA calculation at these few points is not significant relative to the use of the thorium plot, the data were not reprocessed and corrected. Therefore, these MDA data points on the plot should be ignored.

A combination plot incorporates the Cs-137 and KUT data with the total gamma count rate derived from the spectral gamma data and WHC gross gamma data acquired with the Tank Farms gross gamma logging systems. The combination plot allows correlation of Cs-137 occurrence with lithologic features and with the gross gamma log historical record.

A plot of the spectra acquired at 48.0 and 70 ft were prepared to show how bremsstrahlung radiation from Sr-90 causes an elevated low-energy background and creates the total gamma anomaly from 45 to 55 ft.